

MODIFIED WATER DELIVERIES TO ENP ROUND THREE MODELING

The intent of round three modeling for the MWD project was to use a single structural configuration with different operational options for conveyance and seepage control. Six operational options were simulated. While defining the operational criteria for the different alternatives, the desire to simulate L-31N canal without the G-211 structure, led to a slight variation on the structural features: alternatives 7 through 10 being simulated with the G-211 structure removed and alternatives 11 and 12 being simulated with the G-211 structure in place. The structural configuration is described below, followed by the operation options.

Structural Features

Each of alternatives 7, 8, 9, 10, 11 and 12 used the structural features (Fig. 1) below:

For L-67

- 3 Weirs in L67A levee
- L67 C levee degraded and canal filled

For L29 Levee (Tamiami Trail)

- 2 weirs west and 1 weir east of S355A/B
- S356 pump at authorized location pumping into L29 canal

G-211 was removed in Alternatives 7 through 10.

8.5 square mile area

- S357 provides flood control/mitigation to 8.5 sma pumping seepage into the L31N reach north of G211. Hence flows from S357 can contribute to what is pumped back to L29 through S356. This is different from Alts 4, 5 and 6 in which S357 discharged into L31N between G211 and S331. Note that these modeling assumptions in no way endorse any of the sub-regional modeling alternatives being considered for the 8.5 sma. They are simply assumptions used in the SFWMM until a solution to the 8.5 sma is attained.

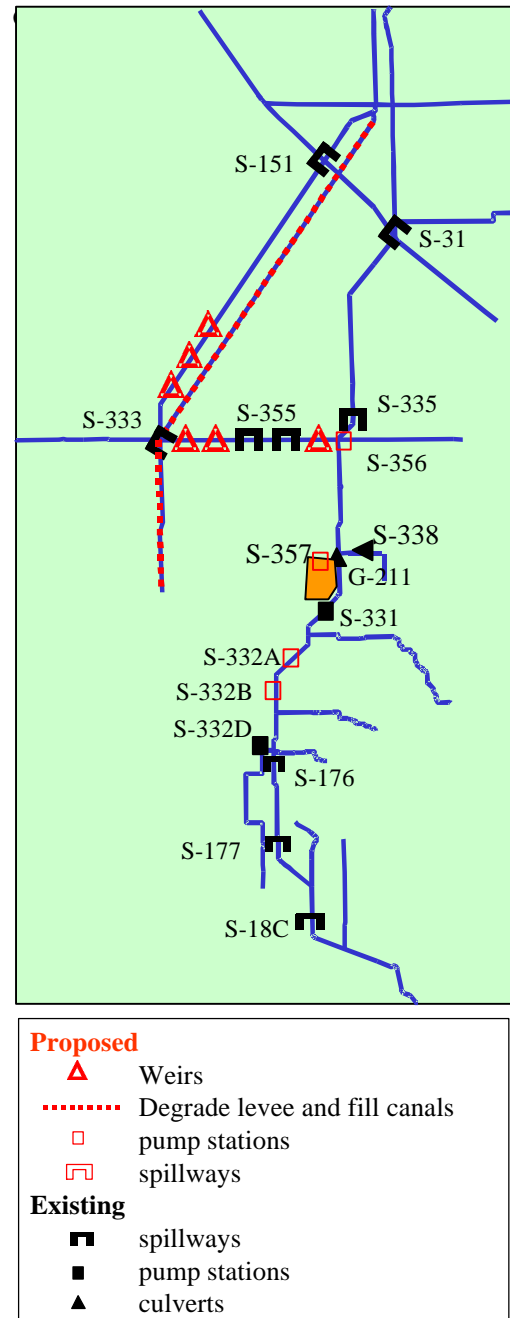


Figure 1. Structural features of Alternatives 7, 8, 9, 10, 11 and 12

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Operations

Table 1 specifies the operations for alternatives 7, through 12. Operational criteria have been entered as bold where they differ from Alternative 4.

Alternative 7: S331 Flood Control Divide - 83 Base ops in L31N

S331 was operated as a true flood control divide, passing only water supply requirements through S331. G211 was removed. The reach of L31N from S335 to S331 was controlled by pumping at S356 into L29 and releases through S338 up to structure capacities. The target stage for L31N was the same as that achieved with 83 base operations (as modeled in 83BSSTA). Incremental pumping with a 700 cfs pump at S356, starting when L31N exceeded 5.0ft, was used to best achieve the target stage in L31N. Releases through S338 were made when L31N exceeded 5.8ft. NSM simulated stages at the cell containing 3A-28 in WCA-3A were used to control stage in WCA-3A. The NSM stages were truncated 2 ft above the land surface (9.35 ft) and at the land surface (7.35 ft).

Alternative 8: WCA operational variation on Alt 7

Alternative 8 was the same as alternative 7 for operation of structures in the South Dade Conveyance system. Different Water Conservation Area operations were used in Alt 8 to give an indication of the operational flexibility available with the specified conveyance and seepage control structural features. The operations in Alt 8 were changed from those in Alt 7 as follows:

- NSM target stages at the 3A-28 gage cell were offset upwards 1.5 ft and then again truncated at 9.35 ft and 7.35 ft.
- L-67 weirs were raised 1.0 ft
- S151 operations were changed to permit stages to rise up to 1.0 ft higher than in Alt 7 at the target cell before making flood control releases.

Alternative 9: S331 Flood Control Divide - 92 Plan ops in L31N

Alternative 9 was the same as Alt 7 except that S356 started pumping when L31N reached 5.5 ft with the pump rate being increased to full capacity when L31N was at 6.0 ft. A 1200 cfs pump was used at S356.

Alternative 10: WCA operational variation on Alt 9

Alternative 10 was the same as Alt 9 for the operation of structures in the South Dade conveyance system. The same WCA operations as those described in Alt 8 were used for WCA operations in Alt 10.

Alternative 11: Pass seepage water south without mitigating in C111 south of S331

The intent of these operations is to pass seepage water south but make no changes to the operation of the C111 project to show the impact of the MWD project passing water south. G211 is used in this alternative as a pseudo divide, passing only water supply requirements until the reach of L31N from S335 to G211 rises above 5.5 ft, at which point G211 starts opening and simultaneous pumping at S356 commences. Releases through S338 still start when the stage in L31N reaches 5.8 ft. The pump capacity at S356 was reduced to 900 cfs because some water is passed south through G211.

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Alternative 12: Pass seepage water south but mitigate with C111 operations.

In contrast to alternative 11, this alternative would pass seepage water south but mitigate for it by holding L31 between S331 and S176 lower and passing more water to both Biscayne Bay and to Everglades National Park. L30 was operated slightly lower to pass more water to the south. S194 and S194 were used to pass flood control water to Biscayne Bay.

Table 1. Specifications operations simulated in Alternatives 7, 8, 9, 10, 11 and 12

Area or Structure		Base 83	LEC95	Alts 7, 8, 9, 10	Alt 11	Alt 12
Lake Okeechobee ops		WSE	Run 25	WSE	WSE	WSE
WCA-1		¹ current regulation schedule				
WCA-2A		² current regulation schedule				
WCA-2B		³ current regulation schedule				
BMP makeup water rule		Yes	Yes	No, but rain driven deliveries to WCA-3A with similar annual average volumes to BMP makeup water rule		
WCA-3A&3B		Zone A/Zone E schedule (9.5 / 10.5 ft)	Current regulation schedule	Rain driven operations		
S12's		Minimum delivery schedule	Restricted rain driven deliveries 10/20/30/40%	Rain driven stage targets (NSM with offsets if needed)		
S333		Water Supply only	⁴ Restricted rain driven deliveries	Rain driven stage targets (NSM with offsets if needed)		
S335	open	7.3	7.5	7.5	7.5	7.3
	close	7.0	7.2	7.2	7.2	7.0
S356	open	non-existent		⁵ 6.0	6.0	6.0
	close			5.5	5.5	5.5
S338	open	5.2 @ S331	5.8 @ G211	6.2 @ G211	6.2 @ G211	5.8 @ G211
	close	4.8 @ S331	5.5 @ G211	5.8 @ G211	5.8 @ G211	5.5 @ G211
G211	open	non-existent	6.0	removed	6.0	5.8
	close		5.5		5.5	5.3
S331	open	water supply only	⁶ 4.8	water supply only	5.0	5.0
	close		4.3		4.8	4.8
S332 A,B,D	open	non-existent	non-existent	5.0	5.0	4.5
	close			4.75	4.75	4.25

¹ Same as used in LEC Alt5 phase I

² In LEC Alt5 phase I WCA2A used rain driven operations

³ LEC alt5 phase I used rain driven inflows to 2B

⁴ L29 canal constrains S333 tail water to 7.5 ft, and G3273 stage constraints apply.

⁵ In Alts 7 and 8, S356 was pumped incrementally to best match 83 Base levels in L31N

⁶ Operated to stage criteria at Angel's well

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Area or Structure		Base 83	LEC95	Alts 7, 8, 9, 10	Alt 11	Alt 12
S194	open	water supply only				4.75
	close					4.25
S196	open	water supply only				4.75
	close					4.25
S332	open	⁷ 4.7	⁸ 4.7	removed		
	close	4.3	4.3			
S174	open	5.7	4.85	not applicable		
	close	5.3	4.65			
S176	open	5.7	5.0	5.3	5.3	5.0
	close	5.3	4.75	5.0	5.0	4.75
S177	open	5.2	4.2	4.2	4.2	4.2
	close	4.3	3.6	3.6	3.6	3.6
S18C	open	2.4	2.6	2.7	2.7	2.7
	close	1.6	2.3	2.3	2.3	2.3
S332E	open	non-existent	non-existent	2.4	2.4	2.4
	close			1.6	1.6	1.6
S197	open	⁹ See footnote	¹⁰ See footnote			
	close	1.9	2.3	2.3	2.3	2.3

Common to 83 Base and Alternatives:

S336 used for water supply only

Common to all alternatives:

S343 A, B would be closed during Jan-June (Sparrow).

⁷ S332: 83 Base: Operated according to minimum delivery schedule for Taylor Slough. Max 165 cfs.

⁸ S332: 95 Base: Use rainfall stage formula as long as it does not violate flood control criteria defined for S332 above. Pump up to 165 cfs between Jan and June to maintain L31W stage between 3.0 and 4.7 ft. Pump up to 500 cfs between July and Dec to maintain L31W stage between 3.0 ft and 4.7 ft.

⁹ S197: 83 Base criteria: S177/S18C open full and S177>4.3, open 3 gates and pull earth plug. In SFWMM flow is limited to keep stage above the gate closed levels specified above.

¹⁰ S197: 95 Base criteria: Uses same as Test 7 phase I criteria, namely: Open 3 gates if S177 open and S177> 4.1 ft or S18C > 2.8 ft. Open 7 gates if S177 > 4.2 ft or S18C > 3.1ft. Open 13 gates if S177 > 4.3 ft or S18C > 3.3 ft. Close when all following conditions are met: 1) S-176<5.2 and S-177<4.2, 2) Storm moved away from basin, and 3) after 1 and 2 are met, keep the number of S-197 culverts open necessary only to match residual flow through S-176. All culverts closed if S-177<4.1 after all conditions satisfied. . In SFWMM flow is limited to keep stage above the gate closed levels specified above.